



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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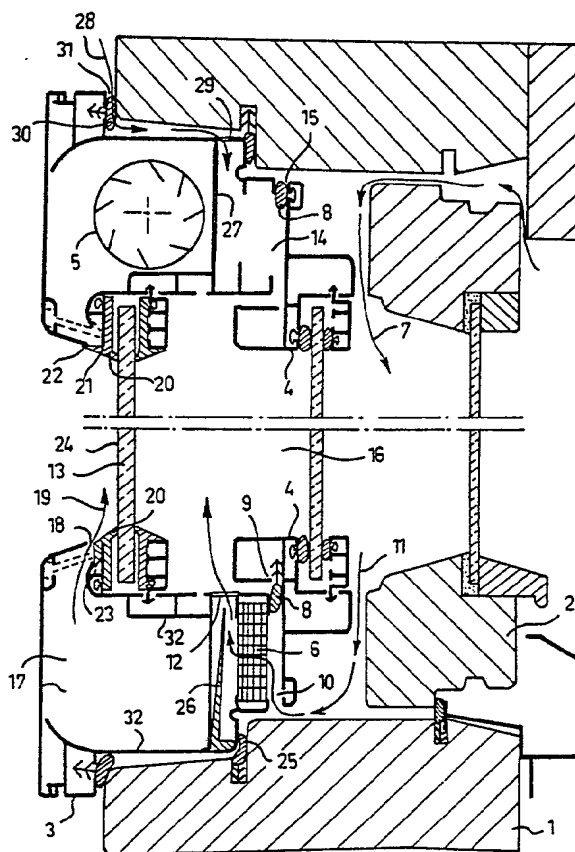
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(54) Title: A WINDOW

(57) Abstract

A window in which the room-side pane (24) is formed as an electric heating element and the surface (13) of an outer pane is provided with a coating in order to reflect back heat radiation. In order to facilitate installation and maintenance both the heating element and the air stream channels including their operating and adjusting means have been placed in a separately installable unit formed by the inner casing (3) and the middle casing (4) connected to it.



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## A window

The present invention relates to a window comprising a frame, an outer casing and an inner casing, and a  
5 channel for fresh air and/or circulating air, the room-side window pane preferably being made as an electric heating element and an outer pane surface is provided with a coating in order to reflect back heat radiation coming outward from the heating element.

10 The object is to provide a new window functioning as an air circulation and heating means in a room and the installation of which is convenient.

The window according to the invention is mainly characterized in that a middle casing including panes is connected to the inner casing to form a separately installable  
15 unit and that this unit comprises the above mentioned heating element and air stream channels and their operating and adjusting means.

Preferred embodiments of the window are defined in  
20 more detail in claims 2 to 6.

Numerous advantages are achieved by the invention. The apparatus combination formed by the inner casing and the middle casing, can handle heating and filtration of incoming air and it further comprises the electrical equipment of the inner window pane which pane functions as a  
25 heating elements, whereby a window may be used with a conventional, existing frame and outer casing, the installation can be carried out by a carpenter without special training. The inner casing profile functioning as an air  
30 channel promotes the heating of fresh air and the muffling of noise, it is not necessary to lead circulation air into the space between the windows, instead it can be mixed with fresh air inside the casing profile.

The air stream is directed along the surface of the  
35 heated pane, whereby the temperature of the fresh air rises.

From the point of view of air circulating and heating it is advantageous to direct the stream of air upward into the room. If wished, it is easy to change the stream of air to be blown from the side and/or from up downward. A  
5 blower may be placed in the upper part of the inner casing, where it is protected, for example, from washing water. The blower does not need a casing of its own, in addition, for example, a filter cloth, a one-way valve, regulating means and needed electric wirings may be installed in the  
10 casing profile.

The middle casing forms a lid for the filter and the blower, whereby the filter can be easily checked and changed only by opening the middle casing. The profile of the inner casing is preferably in two parts, which makes  
15 it easy to install the wirings and operating devices.

In the following the invention will be described with reference to the enclosed drawing, the figures 1 and 2 of which show vertical sections of a window according to the invention; the embodiments differ from each other  
20 only for the part of the inner pane functioning as a heating element.

The window according to the invention comprises a frame 1 and an outer casing 2 of normal structure. An essential novelty is a unit formed by an inner casing 3 and  
25 a middle casing 4, which unit preferably comprises, for example, a blower 5 and a filter 6.

Fresh air flows preferably from the upper portion of the outer casing, arrow 7, into the space between the outer casing and the middle casing and into the lower  
30 portion 10 of the window through the filter 6 installed between the inner casing 3 and the middle casing 4, arrow 11. In case the locations 9 and 15 of the sealings 8 would change place the filter 6 would correspondingly be in the upper portion of the window, whereby fresh air would ad-  
35 vantageously be let in at the lower portion.

Openings 12 are formed in the inner casing 3, through which openings air flows upward along the warmed up surface 13 of the pane and forward via the space 14 into the blower 5, at the location of which the sealing 8 is at location 15, whereby air is allowed into the blower only from the middle space 16 where it has been warmed up.

From the blower 5 the air flows inside the casing, for example, to its lower edge 17, from where it is directed through a slot 18 upward along the surface of the heated pane, arrow 19. A sealing 20 is arranged in the slot 18 which sealing to its configuration interacts with the edges 21 and 22 of the profile in such a way that it can either shut the slot or open it, when it is bended into the space 23.

The room-side window pane 24 comprises an electric resistance known per se, whereby the pane may function as an effective heating element and the pane (surface) 13 next to it in the outward direction reflects heat radiation preferably selectively.

In the inner casing, preferably in connection with the filter 6, it is possible to install an easily moving flap 26 which keeps the connection between the filter 6 and the openings 12 clear when air is flowing inward, but closes the connection if the direction of the stream of air for some reason changes to the opposite.

The middle casing 4 covering the filter cloth and the aspirating opening of the blower is hinged from its side to the inner casing 3 preferably in such a way that when opening it the filter and a blower wing will show, whereby it is easy to reach them.

At the point of the blower 5 there is an opening in the inner casing profile for the air stream, and for mixing the inner air or circulation air 28 with the incoming air there is correspondingly an opening 29 and a by-flow opening 31 at the point of the sealing 30 in the

profile. The inner surfaces 32 of the inner casing profile 3 may be provided with a sound dampening material.

The heating pane at the room-side may be, according to figure 1, a single pane or alternatively, according to  
5 figure 2, a vacuum pane structure 33, whereby the air flow occurs from the outside 16, 34 of a pane 13 provided with a surface reflecting heat radiation selectively. Alternatively, the surface reflecting heat radiation may be provided in the middle pane or in the outermost pane  
10 (no reference numerals), both in figure 1 and in figure 2.

## Claims

1. A window comprising a frame (1), an outer casing (2) and an inner casing (3), and a channel for fresh air and/or circulating air, the room-side window pane preferably being made as an electric heating element and an outer pane surface is provided with a coating in order to reflect back heat radiation coming outward from the heating element, c h a r a c t e r i z e d in that a middle casing (4) including panes is connected to the inner casing (3) to form a separately installable unit and that this unit comprises the above mentioned heating element and air stream channels and their operating and adjusting means.

2. A window according to claim 1, c h a r a c t e r i z e d in that the middle casing (4) is pivotally connected to the inner casing (2) in order to facilitate installation and maintenance of the devices contained in the unit formed by them.

3. A window according to claim 1 or 2, c h a r a c t e r i z e d in that the inner casing (2) is formed of hollow profiles which at least partly form an air channel, which opens into the room so that the air can be blown into the room in the direction of the surface of the inner glass.

4. A window according to claim 3, c h a r a c t e r i z e d in that said air channel is arranged to open into the room from below.

5. A window according to claim 3 or 4, c h a r a c t e r i z e d in that a closable sealing (20) is fitted into the air channel slot opening into the room.

6. A window according to one of the previous claims, c h a r a c t e r i z e d in that the middle casing (4) is connected to the inner casing (3) so that the direction of the stream of fresh air can be chosen.

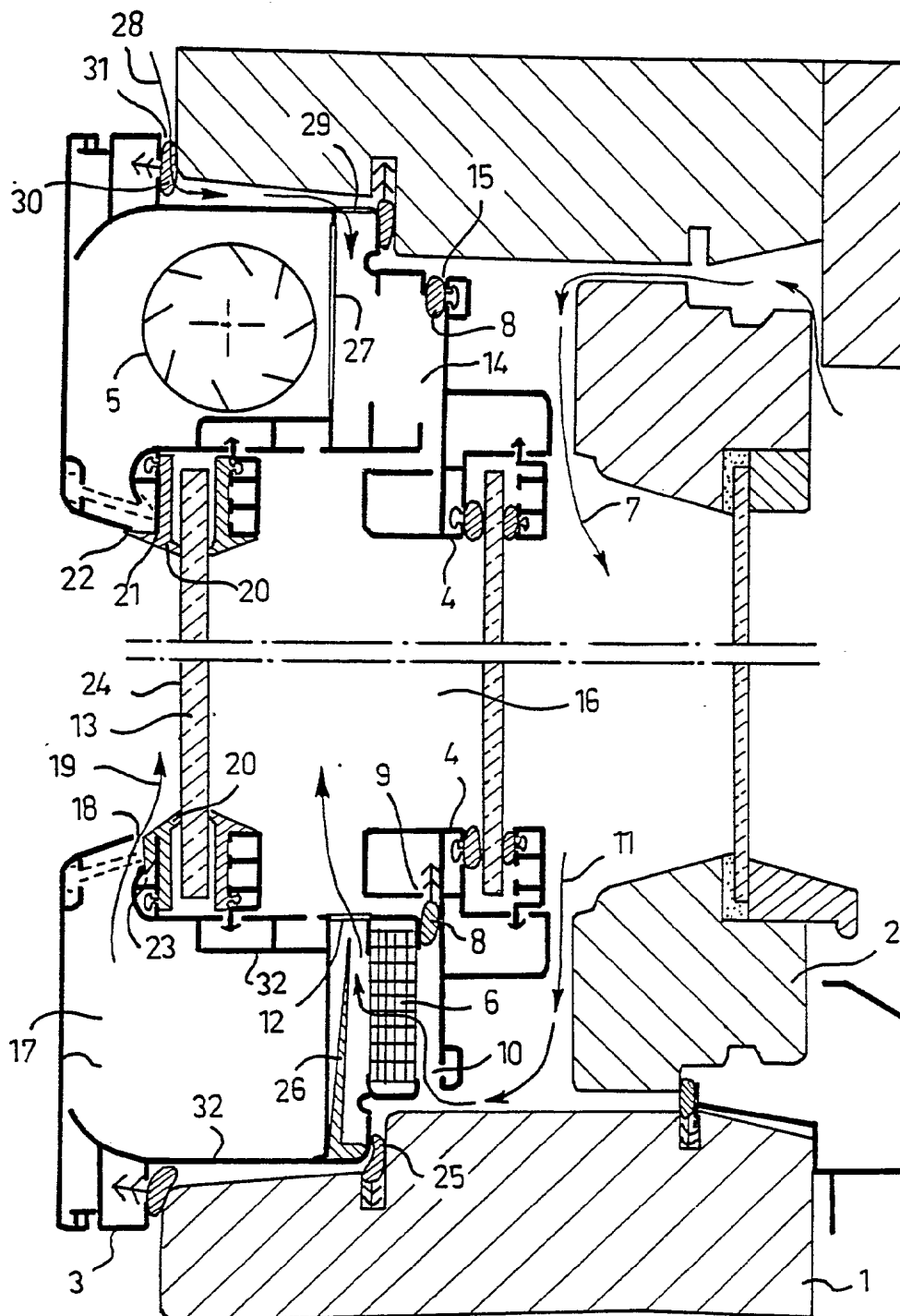


FIG. 1



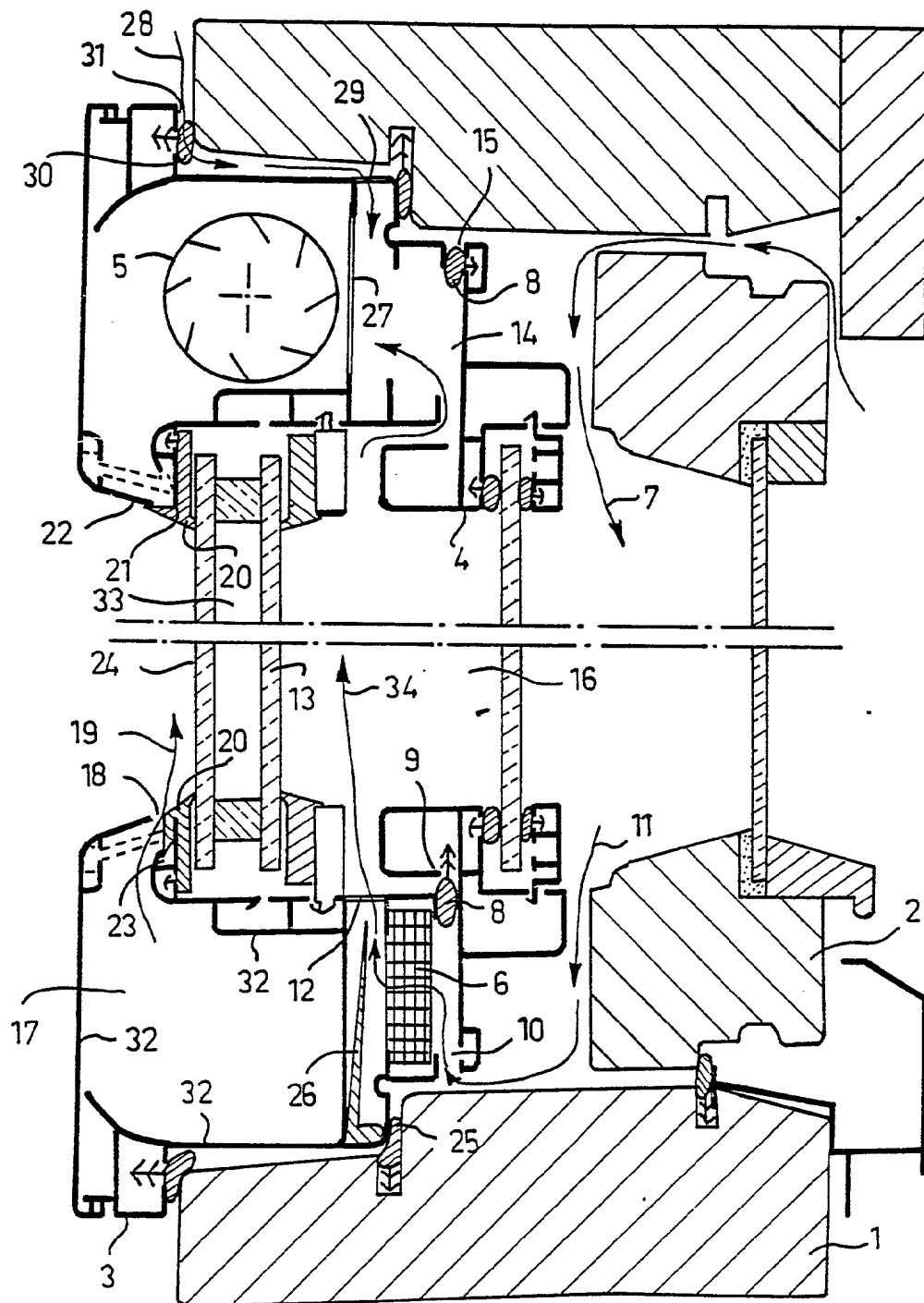


FIG. 2

# INTERNATIONAL SEARCH REPORT

International Application No PCT/FI86/00090

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC <span style="float: right;">4</span>		
E 06 B 7/02, F 24 F 13/18		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
IPC 4	E 06 B 3/28, /64, 7/00, /02, /04, /06, /10; F 24 F 5/00, /10, 13/12, /18	
US C1	165: 47-57	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched *		
SE, No, DK, FI classes as above		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT *</b>		
Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	DE, A1, 2 702 214 (E KOSLOWSKI) 27 July 1978	1
A	DE, C2, 3 043 783 (A WETZEL) 3 June 1982	1
A	EP, A1, 21 164 (H BARTH) 7 January 1981	1
P	DE, A1, 3 422 439 (W ANDREJEWSKI) 17 April 1986	1
P	DE, A1, 3 524 386 (K YOSHIDA) 23 January 1986	1
A	DE, A1, 3 347 028 (K DURM) 4 July 1985	4
A	DE, B, 376 276 (P GILLI) 25 October 1984	4
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>* Special categories of cited documents: <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 48%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
1986-11-20	1986 -11- 21	
International Searching Authority	Signature of Authorized Officer	
Swedish Patent Office	Leif Törn	

**FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET****V. ☒ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE <sup>1</sup>**

This International search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers....., because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claim numbers 2,3,6, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

The wording of claim 2 can not be understood, even with supports of the description. The frame (4) seems to hang in the frame (3) and not in the casing (2).

In the claim 3 is said that the casing (2) is formed of a hollow profil, which seems to be wrong. The wording of claim 6 seems to be a contradiction to what is said in claim 2.

3. ☐ Claim numbers....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

**VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING <sup>2</sup>**

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

**Remark on Protest**

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.